

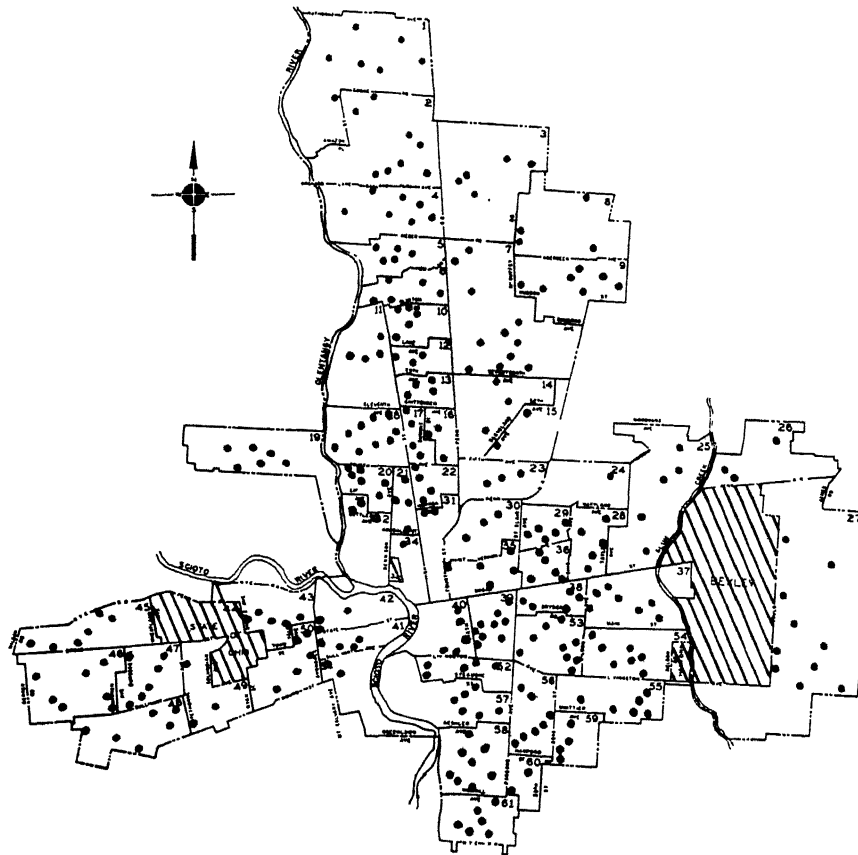
Consumer Preferences

PRACTICES AND DEMANDS IN

Purchasing Eggs

AND POULTRY IN COLUMBUS, OHIO

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THE COVER

Dots on the map of Columbus, Ohio indicate where the 300 home-makers were questioned about their poultry and egg buying preferences. The survey was conducted so as to include practically every income and racial group.

CONSUMER PREFERENCES, PRACTICES AND DEMANDS IN PURCHASING EGGS AND POULTRY IN COLUMBUS, OHIO, 1950

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INTRODUCTION

For many years, agricultural research has been concentrated primarily on improving and increasing the efficiency of agricultural production. Progress made in this field has in some instances created surpluses which have increased the need for improvement in marketing methods. This, in turn, has created a need for more information about consumer preferences, practices, and buying habits in order that marketing improvements can be developed on the basis of a more complete understanding of the problem.

PURPOSE OF STUDY

This study was designed to learn about: (1) egg and poultry consumption within families, (2) family egg and poultry purchasing habits, (3) consumer knowledge and preferences for quality grades and physical characteristics of eggs and poultry in Columbus, Ohio. Some of the important data has been studied in relation to such socio-economic factors as income and race.

DESCRIPTION OF THE SAMPLE AREA

Geographically, Columbus is located in almost the center of Ohio. Greater Columbus has a population of 408,000 people and includes all the corporate limits of Columbus plus the City of Upper Arlington and the villages of Bexley, Grandview Heights, Marble Cliff, Whitehall and Hanford.

Columbus is the main shopping center of Franklin County and is the primary retail trading area for 12 central Ohio counties.

The native white population is approximately 84.5 percent of the total population. Only 3.9 percent of all residents in Columbus were foreign born in 1940. More than 51 percent of all Columbus families are homeowners.

SELECTION OF SAMPLE

This study is based on information secured in an interview with 300 housewives selected to represent each geographical section and each income level, as well as each racial group in Columbus, Ohio.

An economic map of Columbus showing the number of dwelling units by census tracts was used as a basis for securing proper geographic distribution of the housewives interviewed.

The map divided the area within the corporate limits of the city into 61 census tracts; however, two of these tracts were eliminated because the residents or inmates were wards of the State of Ohio.

The percent of total number of dwellings in the city that were located in each of the 59 census tracts was then determined. The resultant figure was multiplied by 300 to determine the exact number of schedules to be completed in each census tract or stratum.

Next, the actual house or houses at which schedules would be secured was determined by first selecting by "pencil pointing" the block or blocks in each stratum. The selection of the specific house and whether it was on the odd or even side of the street was determined by use of Snedecor's table containing ten-thousand random assorted digits. In this method of selection every house in the city had an equal chance of being selected regardless of location.

SURVEY PROCEDURE

Based on the population of Columbus, the study was started by interviewing 300 consumers properly selected to represent each geographical section and each income level, as well as each racial group, with the hope that the sample would prove adequate to be significant. Every home in Columbus had an equal chance of being selected regardless of location. The sample was tested and found to be statistically adequate.

In case the housewife selected on the above basis was not at home, the next occupied dwelling in a predetermined direction was selected. When the house was located on the odd side of the street, the dwelling selected for substitution was to the west or north. When the house was located on the even side of the street, the dwelling selected for a substitution was to the east or south, thus moving in a clockwise direction.

Exactly 150, or one-half, of the interviews were completed in the morning, and the other half were completed in the afternoon.

To determine the reliability of the sample, the Chi-square test was used to measure the degree to which frequencies in the actual distribution of answers to two important questions did not conform to the theoretical distribution of the same answers.

In both cases Chi-square was insignificant and the difference between the theoretical distributions of the answers to each question and the actual distribution of the answers was insignificant, indicating that the sample of 300 consumers was reliable for the study.

A further indication of the reliability of the sample was provided by the Chamber of Commerce data which showed 11.6% of the population of Columbus were negroes, while in the random sample studied, exactly 11% of the housewives interviewed were negroes.

The 300 housewives interviewed in this survey were contacted during the period from September 7 to October 20, 1950. All interviews were conducted in the home. Questionnaires were edited and partially coded within 15 hours after completion.

REFERENCE TO THE LITERATURE

A few studies of consumer egg and poultry preferences and consumer buying practices were completed prior to War II. Since then, there has been a marked increase in the number of consumer studies conducted. Such studies need to be made constantly because market conditions and consumer buying habits are continually changing.

Baker and Goldman (1951) reported that among those consumers interviewed in Des Moines there was a significant, positive relationship between per capita income and egg consumption; but, in addition, other psychological or sociological factors were also found to be important.

The largest percentage of consumers in most areas purchase eggs once each week. The work reported indicates that approximately 50 percent of the consumers in many areas purchase eggs directly from farmers, or farmer's agents other than regular wholesalers or retailers. The trend is for more housewives to purchase eggs from reputable retail outlets.

A review of the literature indicates that brand names and trade marks have made little impression on consumers. Egg size, price, and freshness or quality grade are very important factors which housewives consider in making egg purchases. The trend is to consider the quality of eggs more important than the price.

Most consumers now keep eggs under refrigeration in their homes.

There is a decided increase in the number of consumers who want to purchase eggs in cartons instead of paper bags. However, recent studies in Wichita, Kansas and Richland County and Upper Arlington, Ohio showed that fifty percent of the housewives interviewed were purchasing eggs in bulk.

Housewives in recent years have registered fewer complaints concerning eggs they have purchased. The types of complaints that are mentioned vary widely in different areas.

Erdman, Alcorn and Mace (1941) reported that most of the women interviewed in Los Angeles had but a vague notion of indicators of egg quality. Typper and Harris (1950) reported that the results of the sample of reliability test used in their Peoria study showed that 67.1 percent of all housewives interviewed could give one valid answer to what constitutes egg quality.

Shell color and yolk color preferences vary widely between different areas. It is significant, however, that work in many areas has indicated that there is often no majority preference for any particular shell or yolk color.

Tenley and Voorhies (1940) stated that race and nationality were two important factors which influenced buying habits of poultry consumers in California.

A review of the literature indicates that over a period of about 20 years, income has had increasingly less effect each year on consumption habits of those who eat chicken or turkey.

Recent work indicates that fried chicken is the most popular way of serving chicken in most areas. Purchases as well as consumption of chicken and turkey parts have increased materially in recent years.

The trend is for more poultry to be sold in poultry markets and other types of retail stores and less to be sold directly by farmers. Most consumers now prefer to purchase ready-to-cook poultry.

GENERAL PATTERN OF NATIONAL EGG AND POULTRY CONSUMPTION

National egg and poultry consumption has increased materially during the last ten years. Some factors responsible for this increase were: (1) more people had more money to spend on "luxury" items, (2) the rationing and scarcity of red meats, (3) eggs and poultry have



Fig. 1.—A large amount of the poultry and eggs produced not only in Ohio but in the nation as a whole come from production centers such as these. Many farmers have specialized in poultry production while others have found it a profitable sideline.

been relatively low priced, (4) consumers could secure better quality eggs and poultry through the normal retail channels, and (5) the emphasis placed on proper nutrition. Eggs were named among the seven basic foods recognized as essential to the maintenance of minimum health standards.

Although there has been a rather constant increase in the per capita consumption of turkey in the United States, present consumption is still relatively low. The per capita consumption of turkey should increase materially when the economic advantages associated with the purchase of turkey during the so-called “off” season is recognized by consumers.

The per capita consumption of eggs has become more evenly distributed throughout the year. During the last few years consumption per capita has averaged close to 30 eggs during each month, whereas a few years ago the figure fell below 20 eggs per month during the period of high prices in the fall and winter.

RESULTS

EGG CONSUMPTION WITHIN FAMILIES

Number of Eggs Used, Including Per Capita Consumption. There was a total of 1,094 persons in the 300 families surveyed or an average of 3.65 persons per family. Based on the consumption of eggs during the period when this survey was made, the average per capita con-

TABLE 1.—The Average per Capita Consumption of Poultry and Eggs in the U. S. for Alternate Years, 1910-50*

Year	Chicken, dressed weight†	Turkey, dressed weight†	Eggs
	Pounds	Pounds	Number
1910	20.4	‡(1.2)	307
1912	19.7	(1.3)	311
1914	19.1	(1.3)	295
1916	18.3	(1.4)	299
1918	17.6	(1.4)	284
1920	18.1	(1.5)	299
1922	18.7	(1.5)	315
1924	19.1	(1.6)	324
1926	19.6	(1.6)	338
1928	20.0	‡(1.7)	338
1930	21.5	(1.8)	329
1932	19.7	2.1	311
1934	18.8	2.2	287
1936	18.1	2.7	287
1938	16.8	2.7	308
1940	18.7	3.5	317
1942	23.4	3.7	316
1944	26.8	3.3	350
1946	25.4	4.5	374
1948	23.0	3.7	386
1950	26.4	4.9	386
1952	29.6	5.4	407

*Civilian only.

†Most retail sales of poultry are on a dressed-weight basis, although a small amount is sold eviscerated. Factor for obtaining eviscerated weight from dressed weight for chickens is 73 percent; turkeys, 83 percent.

‡Based on straight line projection 1910-28.

Source: United States Department of Agriculture, Bureau of Agricultural Economics, "Consumption of Food in the United States 1909-48," Miscellaneous Publication No. 691, August 1949, Table 29, p. 111.

sumption of eggs was estimated at 327¹ eggs per person per year for members of the families interviewed. However, this figure does not include eggs consumed in prepared mixes and table-ready food products. In addition, the survey was made during the period of the highest annual price of eggs, and a total of 74, or 24.7 percent, of the consumers interviewed reported that they used more eggs during the season of low egg prices.

The per capita egg consumption in high income families exceeded per capita consumption in low income families by approximately 10 eggs per person per year. Negroes interviewed were using fewer eggs than white persons at the time of the study.

Uses of Eggs. Eggs continue to be primarily a breakfast food in Columbus. Forty-five percent of the housewives interviewed reported serving eggs for breakfast every day during the year. Another 20.3 percent of the housewives interviewed served eggs for breakfast from 4 to 6 times each week, and less than 10 percent of the consumers interviewed stated that they never served eggs for breakfast.

In studying the method of preparation of eggs which most people preferred, it was found that fried eggs were preferred by the majority of persons in 60.3 percent of all households studied. Poached and boiled each accounted for the response given by 14 percent of the families, and 11.7 percent of the housewives reported that scrambled eggs were preferred by the majority of their family.

Only 14.9 percent of the consumers interviewed used more than 50 percent of their eggs for baking and cooking purposes.

FAMILY EGG PURCHASING HABITS

Egg Price-Purchase Relationships. Only 6.3 percent of the consumers interviewed reported using less expensive eggs for cooking than for table use, and the other 93.7 percent of the housewives stated that they used the same quality eggs for both purposes; however, a relatively high percentage of consumers interviewed did not use the highest quality grade of eggs at any time.

A relatively larger number, or 12.1 percent, of all negro housewives interviewed reported using less expensive eggs for cooking than for table use.

¹This figure was arrived at in the following manner: (1) the number of eggs used during the week prior to interview was converted to an annual per capita figure, (2) the number of eggs purchased during the week prior to interview was adjusted according to the frequency of individual consumer's egg purchases and was converted to an annual per capita figure, and (3) the two figures were averaged to estimate annual per capita egg consumption.

TABLE 2.—Method of Preparation of Eggs Preferred by the Majority of Persons in the 300 Families Interviewed in Columbus

Form preferred	Households	
	Number	Percent
Fried	181	60.3
Poached	42	14.0
Boiled	42	14.0
Scrambled	35	11.7
Total	300	100.0

Almost one-fourth, or 24.7 percent, of the consumers interviewed reported purchasing more eggs during the season of low egg prices. Only 9.5 percent of the high income group reported using more eggs when egg prices were low, while 26 percent of the low income group reported using more eggs during the season of low egg prices. A total of 24.2 percent of all negro housewives interviewed reported using more eggs when prices were low.

The housewives were asked, "What factors about eggs are worth an extra price to you?" More than 50 percent of those who responded mentioned some factor which, in effect, indicated high quality. Large size was listed by 16.2 percent, and 5.1 percent listed either official inspection or color.

It was notable that 56.5 percent of the housewives interviewed mentioned high quality or official inspection. There were, however, 24.9 percent of the housewives interviewed who stated that they knew of nothing for which they would pay a premium.

A total of 84.5 percent, of the high income group and about 58 percent of the low income group were willing to pay a premium for some one factor about eggs, but only 36.3 percent of all negro housewives interviewed were willing to pay an extra price for any factor about eggs.

TABLE 3.—Effect of Price on Purchases of Eggs

Consumer practice	Housewives interviewed	
	Number	Percent
Do not increase purchases when prices are low	226	75.3
Do increase purchases when prices are low	74	24.7
Total	300	100.0

TABLE 4.—Factors About Eggs Which Were Worth an Extra Price to Consumers

Factor	Number of times factor was listed	Percent of total number of factors listed
Quality	179	53.8
Large size	54	16.2
Official inspection	9	2.7
Color	8	2.4
Nothing	83	24.9
Total	333*	100.0

*Twenty-nine persons listed two factors, and two persons listed three factors.

Value of Eggs to Consumers. In reply to the question, "What is the main reason why you use eggs?," 46.2 percent of the housewives interviewed reported "Because we like them," 32.3 percent reported "Health properties," and 11.4 percent stated that they used eggs because they were convenient. "Economical" was listed as the reason by 6.3 percent, while "doctor's orders" was responsible for the reply of 3.6 percent of the housewives.

Frequency with Which Eggs Were Purchased. A majority, or 69.3 percent, of the housewives interviewed reported that they purchased eggs once each week. Seventeen percent purchased eggs every other week, and 4.7 percent reported buying eggs less often. Only 7.7 percent of the housewives interviewed purchased eggs twice weekly, and 1.3 percent purchased eggs daily.

Sources of Eggs for Household Use. Approximately 37 percent of the housewives interviewed purchased their eggs regularly from retail grocers. The next most important source of eggs was at farms, accounting for 23.3 percent of the consumers' replies. This was followed by deliveries by farmers, accounting for the source of eggs of 18.4 percent and poultry markets accounting for 11.3 percent of the housewives interviewed. Other sources listed by 7.0 percent of the housewives interviewed were hucksters, confectionery stores, dairy stores, and miscellaneous.

It was significant that 41.7 percent of all consumers interviewed purchased eggs from farmers, or people who they thought were farmers, either directly or at the farm. While some of these consumers purchased eggs from farmers to obtain lower prices, most of them expected to get fresher, higher quality eggs than they could obtain elsewhere. Many housewives in this group made very disparaging remarks about "store eggs".



Fig. 2.—The production of good quality eggs is dependent upon such practices as these. Here eggs are being gathered in rubber covered wire baskets to reduce breakage and to facilitate rapid cooling of the eggs.

TABLE 5.—Where Consumers Interviewed in Columbus Purchased Most of Their Eggs

Source	Consumers	
	Number	Percent
Retail grocer	110	36.7
At the farm	70	23.3
Delivered by farmer	55	18.4
Poultry market	34	11.3
Variable (those above) depending on season	11	3.6
Delivered by huckster	8	2.7
Confectionery	4	1.3
Dairy store	3	1.3
Miscellaneous	5	1.7
Total	300	100.0

Relationship of Egg Purchases and the Purchase of Other Groceries. The consumers interviewed were asked if they purchased most of their eggs where they purchased most of their other groceries. It is significant that 67.7 percent of these housewives reported that they did not buy most of their eggs at the same place where they bought other groceries, which further emphasizes the dissatisfaction of some consumers with eggs sold by retail grocers.

Housewives' Most Important Consideration When Purchasing Eggs. Approximately two-thirds, or 66.4 percent of the housewives listed "quality" as the most important consideration in purchasing eggs, twenty-three percent mentioned "price", and "size" was listed by only 9 percent.

Carton and Bulk Purchases of Eggs by Consumers. A few more than half, or 53.7 percent, of the consumers interviewed purchased eggs which had been packed in cartons. The majority of the remaining 46.3 percent who purchased eggs in bulk, bought eggs in paper bags.

There was no significant difference between carton and bulk egg purchases as related to various income groups within the city.

Consumer Problems in Purchasing Eggs. Housewives interviewed were asked to name the most troublesome problem with which they were confronted when purchasing eggs. Over four-fifths, or 82.1 percent, of the consumers interviewed stated that they had no problems in purchasing eggs.

TABLE 6.—Most Important Considerations in Making Egg Purchases

Most important consideration	Consumers interviewed	
	Number	Percent
Quality	199	66.4
Price	69	23.0
Size	27	9.0
Shell texture	1	.3
Nothing	4	1.3
Total	300	100.0

Finding fresh eggs was the biggest problem listed by 7.3 percent of the consumers, and finding the quality desired was mentioned by 7 percent. These two problems are very closely related. The remaining 3.6 percent stated that egg prices were too high or that they had trouble finding eggs of the size or color desired.

Consumer Complaints about Eggs. The housewives interviewed were asked to state what complaints they had about the eggs that they had purchased during the previous month.

Of the 42 consumers that complained about the quality of eggs purchased, 12 consumers or 29.0 percent listed watery whites as the reason; another 12.5 percent of all complaints were about having been sold rotten eggs. The remaining 58.4 percent of the complaints, in order of importance, consisted of the following: flat yolks, blood spots, strong taste, bad odor, mottled yolks, cloudy whites, moldy taste, green yolks, germ development, dirty eggs, and eggs too small.

TABLE 7.—Carton and Bulk Egg Purchases by Consumers

Carton or bulk purchase	Consumers interviewed	
	Number	Percent
Bulk	139	46.3
"Two-by-six" carton	126	42.0
"Three-by-four" carton	35	11.7
Total	300	100.0

TABLE 8.—Sources of Eggs Bought by Consumers Who Reported Securing Poor Quality Eggs During the Month Prior to Interview

Source of eggs	Total number purchasing from each type of source	Consumers with complaints on eggs:	
		Number	Percent of total consumers with complaints (Percent)
Retail grocer	119	26	21.9
Delivered by farmer	55	5	9.1
Delivered by huckster	8	5	62.5
Poultry market	35	3	8.6
Poultryman at farm	71	3	4.2
Total	288	42	14.6

Each consumer that had a complaint on the quality of eggs purchased was asked to give the source of the eggs. Sixty-two percent of the housewives that purchased eggs from hucksters had complaints on the quality; 21.9 percent of those that purchased eggs from retail grocers, 9.1 percent that purchased from farmers that delivered the eggs, 8.6 percent that purchased from poultry markets and only 4.2 percent of the consumers that purchased eggs from poultrymen at the farm had any complaint on quality. A total of 14.6 percent of the consumers interviewed complained about the quality of the eggs they purchased.

TABLE 9.—Determinants of "Broken-out" Egg Quality Used by Consumers

Determinant	Number of times determinant was listed	Percent of total number of all responses
Firm yolk	132	33.5
Firm white	66	16.8
Odor	56	14.2
Yolk color	42	10.7
Cloudy or Runny White	26	6.6
Blood	25	6.4
Miscellaneous	9	2.4
No method of determining egg quality	24	6.0
Total	393*	100.0

*Seventy-seven housewives listed two determinants, and eight listed three determinants.

More than one-half, or 57.1 percent of the 42 housewives reported that they no longer purchase eggs from the dealer who was responsible for selling them low-quality eggs.

Several of the 42.9 percent who continued to purchased eggs from the same source reported that the dealer had made good on the undesirable eggs. Others stated that it would be too inconvenient to locate another source of supply.

CONSUMER KNOWLEDGE OF AND PREFERENCES FOR QUALITY GRADES AND PHYSICAL CHARACTERISTICS OF EGGS

Consumers' Knowledge and Practices Concerning Egg Quality. Consumers interviewed in Columbus were asked to explain their method of determining whether eggs were of high interior quality before making a purchase. A large majority, or 89.7 percent, of the housewives stated that they had no way of determining interior quality before purchasing eggs. The remaining 10.3 percent reported that they attempted to select eggs of the highest quality by examining the shell texture, by observing the shape or size, by shaking them, by spinning them, or by dipping them in salt water.

The data in Table 9 indicate the ways in which consumers determined egg quality after breaking eggs out in their kitchens. Eight percent of all housewives interviewed stated that they had no knowledge of how to judge interior egg quality. Two methods were listed by 25.7 percent of the housewives interviewed, and 2.7 percent listed three methods.

Firm, upstanding yolk as a determinant of egg quality was included in 33.5 percent of the responses and firm white 16.8 percent. Next in order of importance as determinants were odor, yolk color, blood, cloudy white, and runny white, together making up 37.9 percent of the responses.

These results indicate that a majority of the consumers interviewed had a reasonable understanding of at least one method of determining "broken out" egg quality.

Only 10.3 percent of the consumers interviewed reported that they noticed a seasonal variation in egg quality. Almost three-fourths of this group reported that egg quality was lowest during the summer.

Forty-one percent of the consumers reported purchasing quality graded eggs, while the remaining 59 percent did not purchase eggs which had been graded for quality.

TABLE 10.—Purchase of Quality Graded Eggs by Consumers

Consumer action	Consumers interviewed	
	Number	Percent
Did not purchase quality graded eggs	177	59.0
Purchased quality graded eggs	123	41.0
Total	300	100.0

A slightly higher than average number, or 41.6 percent, of the consumers in the high income group purchased quality graded eggs, while only 30 percent of the housewives in the low income group purchased eggs that had been graded for quality. The largest percentage of consumers, or 51.7 percent, that bought quality graded eggs were in the two middle income groups.² Many consumers in the high income group purchased eggs from farmers who ordinarily do not sell quality graded eggs.

A total of 30.3 percent of all negro consumers interviewed purchased eggs that had been graded for quality.

More than 50 percent of the consumers who did not purchase quality graded eggs reported that they purchased eggs from farmers who did not grade eggs for quality. Only 15.3 percent of this group stated that they could buy eggs at a lower price because they were not graded for interior quality.

TABLE 11.—Quality Grade of Eggs Purchased by Consumers

Quality grade of eggs purchased	Number of consumers interviewed	Percent of consumers who purchased quality graded eggs
AA	1	.8
A	117	95.2
B	3	2.4
Not known	2	1.6
Total	123	100.0

²The population sample was divided into four income groups for the purpose of income analyses reported in this bulletin.

Of the 123 consumers interviewed that purchased quality graded eggs, only one housewife claimed to purchased eggs of AA quality. One hundred and seventeen, or 95.2 percent, of this group reported that they



Fig. 3.—This producer is weighing and grading his eggs. Aided by the chart on the wall, he separates the eggs according to size and condition, assuring himself of the best market price and providing a consistently good product for the consumer.

TABLE 12.—Consumer Selection of Best Quality Eggs Based on Color Pictures of the Four U. S. "Consumer" Grades of Eggs

Quality grade of egg selected	Consumers interviewed	
	Number	Percent
AA	162	54.0
A	48	16.0
B	29	9.7
C	61	20.3
Total	300	100.0

purchased Grade A eggs. Only 3 consumers purchased Grade B eggs, and two housewives did not know what grade of eggs they purchased.

An effort was made to determine consumers' preferences for interior egg quality in relation to United States Standards of Quality. A chart was prepared showing a picture of broken-out eggs of each of the four U. S. Consumer grades. The color pictures were mounted on a circular disc. An "x" followed by a random number was placed on all four sides of each picture in an effort to eliminate bias. (See page 29).

After explaining that all of the eggs pictured on the disc were of the same size, the consumers were given the disc and asked to select the best or highest quality egg.

TABLE 13.—Yolk Color Preferences

Preferences	Consumers interviewed	
	Number	Percent
Light	38	12.7
Medium	116	38.7
Dark	71	23.6
Varied, according to consumptive use*	33	11.0
No preference	42	14.0
Total	300	100.0

*More than 50 percent of this group preferred Medium colored yolks for table use and Dark colored yolks for baking and cooking



Fig. 4.—Quick cooling of eggs is accomplished by farm egg coolers such as these constructed with a burlap cover that evaporates water from a pan on top. Eggs are placed in the trays and cooled for at least 12 hours before placing them in cases. Note thermometer and humidity gauge.

Seventy percent of all housewives interviewed selected either the AA or A quality eggs. Only 9.7 percent of the housewives selected the B quality eggs, and 20.3 percent of all consumers interviewed thought the C quality egg was the highest in quality.

Almost without exception, those who selected the AA or A egg could substantiate their preference with a good reason.

Egg Holding and Care in the Home. Almost all, or 97.6 percent, of the consumers interviewed reported that they kept their eggs in a refrigerator. The remaining 2.4 percent of the housewives kept their eggs at room temperature, either in the kitchen or in the pantry.

Size of Eggs Purchased and Preferred by Consumers. Twenty-nine percent of the consumers interviewed reported that they purchased eggs ungraded for size.

Two percent of the consumers purchased extra large eggs, and 48.4 percent bought large eggs when they were available. Only 13.3 percent of the consumers interviewed reported purchasing medium size eggs and two percent reported purchasing small eggs regularly.

Yolk Color Preferences. Seventy-five percent of the consumers interviewed indicated a yolk color preference, regardless of the purpose for which the eggs were to be used. Eleven percent of the housewives had a yolk color preference based on whether the eggs were to be used for table purposes or for baking and cooking. Fourteen percent of the consumers interviewed had no yolk color preference.

Of the first group, the largest number, accounting for 38.7 percent of all housewives interviewed, stated a preference for medium yolk color. This was followed by 23.6 percent with preference for dark yolks, and 12.7 with a preference for light colored yolks.

The largest number of those consumers who had a variable preference, liked medium yolks for table use and dark yolks for baking and cooking.

There was no apparent trend of yolk color preference in particular neighborhoods or nationality groups.

Many housewives were more concerned with uniformity of yolk color than with the actual shade of color.

Shell Color Preferences. There seemed to be no decided preference for any particular shell color among consumers interviewed in Columbus. Sixty-two percent of all consumers interviewed reported that they

TABLE 14.—Egg Shell Color Preferences

Shell color preference	Consumers interviewed	
	Number	Percent
No preference	166	62.0
White	56	18.7
Brown	53	17.7
Cream	5	1.6
Total	300	100.0

had no shell color preference. A preference for white eggs was indicated by 18.7 percent of the consumers interviewed, followed by a preference for brown eggs by 17.7 percent of the housewives.

POULTRY

Frequency with Which Chicken is Served. Most families ate chicken frequently. Only 12.7 percent of all consumers interviewed served chicken less than once each month, but every one in this group reported serving chicken at least once during the year.

Slightly more than one-fifth of the consumers interviewed served chicken an average of at least once each month, and slightly less than one-fourth served chicken an average of at least twice each month.

TABLE 15.—Average Number of Times per Month Chicken was Served

Number of times chicken served per month	Consumers interviewed	
	Number	Percent
Less than once	38	12.7
Once	62	20.6
Twice	73	24.3
Three times	31	10.3
Four times	81	27.0
Five times	2	.7
Six times	2	.7
More than six times	11	3.7
Total	300	100.0

TABLE 16.—Form in Which Poultry Was Preferred

Preferred form	Consumers interviewed	
	Number	Percent
Fried	254	84.7
Roasted	27	9.0
Stewed	19	6.3
Total	300	100.0

Approximately one-tenth of the consumers interviewed reported serving chicken three times each month, more than one-fourth served chicken four times per month, and only 5.1 percent reported serving chicken an average of five or more times in a month.

Consumers interviewed in the high income group served chicken more often on the average than the consumers interviewed in the middle or low income groups. Negroes interviewed served chicken an average of more than twice as often as all other consumers interviewed.

Preferences and Practices in Cooking Poultry. The majority, or 84.7 percent, of the housewives interviewed reported a preference for fried chicken by their family. Nine percent of the families had a preference for roast chicken, and 6.3 percent preferred stewed chicken.

Classes of Live and Market Poultry Preferred by Consumers. A large number, or 81.6 percent, of the consumers interviewed had a preference for some form of poultry that is ready-to-cook. The next

TABLE 17.—Kind of Poultry Consumers Prefer to Purchase

Kind preferred	Consumers interviewed	
	Number	Percent
Ready-to-cook	245	81.6
Alive	38	12.7
Frozen	11	3.7
New York dressed	6	2.0
Total	300	100.0

largest group, or 12.7 percent, indicated a preference for live poultry. Only 3.7 percent preferred to buy frozen poultry, and two percent preferred New York dressed poultry.

Thirty-three percent of the consumers interviewed actually purchased poultry in a different form than what they preferred. This occurred in most instances because a consumer could not locate a satisfactory source of poultry of the type desired.

It was significant that such a large number of consumers stated a preference for ready-to-cook poultry; however, there is still a small percentage of consumers who prefer to purchase live poultry, either because they want to be certain of the condition of the chicken or because no one else can kill and dress it to their satisfaction.

Many consumers made disparaging remarks about frozen poultry. Several remarks had to do with lack of flavor or poor taste; however, most of the remarks concerned the poor keeping qualities which they have associated with frozen poultry.



Fig. 5.—This is an egg grading or sizing machine to insure a uniform size egg for the consumer. Nearly half of the persons interviewed bought large eggs when available.

Sources of Poultry for Household Consumption. Fifty-two percent of the consumers interviewed purchased their poultry from retail grocers, 31 percent from poultry markets, 13 percent bought poultry at the farm, while farmers delivered poultry to 3 percent.

In general, consumers were very well satisfied with the poultry secured from grocery stores and poultry markets. A large number of housewives made favorable comments about the high quality chickens which they had purchased from chain stores.

Consumer Complaints about Poultry Purchased. Only 11.3 percent of the consumers interviewed had any complaint about the poultry they purchased. In fact, much favorable comment was expressed regarding the quality of poultry available to consumers in Columbus.

"Price" headed the list of complaints and was listed by four percent of all housewives interviewed, "poor quality" was listed by another 2.7 percent, and "dressing defects" was mentioned by 1.3 percent. Other complaints, accounting for 3.3 percent of the responses, included too small size, availability, lungs left in, difference in quality between parts, livers not cleaned, broken bones, poor flavor, giblets withheld by dealer, and poor general appearance.

Frequency with Which Turkey was Served. The replies of the consumers interviewed indicate that turkey is still primarily a holiday luxury. Only six percent of all housewives interviewed reported serving turkey three or more times a year. Forty-two percent served turkey once each year, and 27.3 percent reported serving turkey twice per year. Almost one-fourth, or 24.7 percent, of all housewives interviewed never served turkey.

TABLE 18.—Sources of Poultry

Source	Consumers interviewed	
	Number	Percent
Retail grocer	156	52 0
Poultry market	93	31 0
At the farm	39	13 0
Delivered by farmer	9	3 0
Miscellaneous	3	1.0
Total	300	100 0

TABLE 19.—Complaints About Poultry Purchases by Consumers

Complaint	Consumers interviewed	
	Number	Percent
None	266	88.7
Price too high	12	4.0
Poor quality	8	2.7
Miscellaneous*	14	4.6
Total	300	100.0

*For explanation see preceding page.

Consumers in the higher income group served turkey more frequently than those in the lower income groups. Negroes interviewed served turkey less frequently than the white persons interviewed.

Consumer Reaction to Buying Turkey Halves, Quarters and Parts.

Consumers were asked if they would purchase more turkey or serve turkey more often if halves, quarters, and parts were readily available. Slightly more than one-half, or 56.3 percent, of the consumers interviewed replied that they would not buy or serve more turkey regardless of how it was sold.

An analysis by income and social groups indicated that a larger percentage, or 52.3 percent, of the middle income families would serve turkey more often if halves, quarters, and parts were readily available

TABLE 20.—Frequency with Which Turkey Was Served per Year

Number of times served per year	Consumers interviewed	
	Number	Percent
None	74	24.7
Once	126	42.0
Twice	82	27.3
Three times	10	3.3
Over	8	2.7
Total	300	100.0

**TABLE 21.—Reaction to Buying Turkey in Halves, Quarters
and Parts by Consumers**

Consumer reaction	Consumers interviewed	
	Number	Percent
Would not purchase more turkey if halves, quarters or parts were readily available	169	56.3
Would purchase more turkey if halves, quarters or parts were readily available	131	43.7
Total	300	100.0

than families in any other income group. A total of 42.8 percent of the high income group, 36 percent of the low income group, and 39.3 percent of the negro consumers interviewed reported that they would serve turkey more frequently if it were available in cut-up form.

Duck and Goose Consumption. Less than one-fourth of the consumers interviewed, or 23.4 percent, served duck one or more times during the course of a year, and only nine percent served goose from one to three times annually.

Geese were used principally as holiday birds by most of the consumers who reported serving goose. Of the 91 percent who did not serve goose, a high percentage had never tasted it. Some objected to goose because it is too greasy and others complained because there was too much waste in a goose.

**TABLE 22.—Frequency with Which Duck and Goose are Served
Annually by Consumers**

Number of times served annually	Duck		Goose	
	Consumers interviewed		Consumers interviewed	
	Number	Percent	Number	Percent
None	231	76.6	273	91.0
Once	51	17.0	21	7.0
Twice	11	4.0	5	1.7
Over	6	2.4	1	.3
Total	300	100.0	300	100.0

DISCUSSION

It is significant that 62.6 percent of the homemakers interviewed in Columbus mentioned high quality or official inspection when asked what factors about eggs were worth an extra price to them. However, 27.6 percent of the housewives interviewed reported that they knew of nothing about eggs for which they would pay a premium.

It is difficult to understand why more than one-fourth of the consumers interviewed in Columbus do not feel that they can afford to spend a few extra pennies each week to be sure of getting high quality eggs.

At the time of the study, some housewives made very disparaging remarks about the quality of eggs purchased at retail stores. A few years ago this complaint might have been legitimate, but today there is little cause for this reaction because most retailers have reliable sources of high quality eggs.

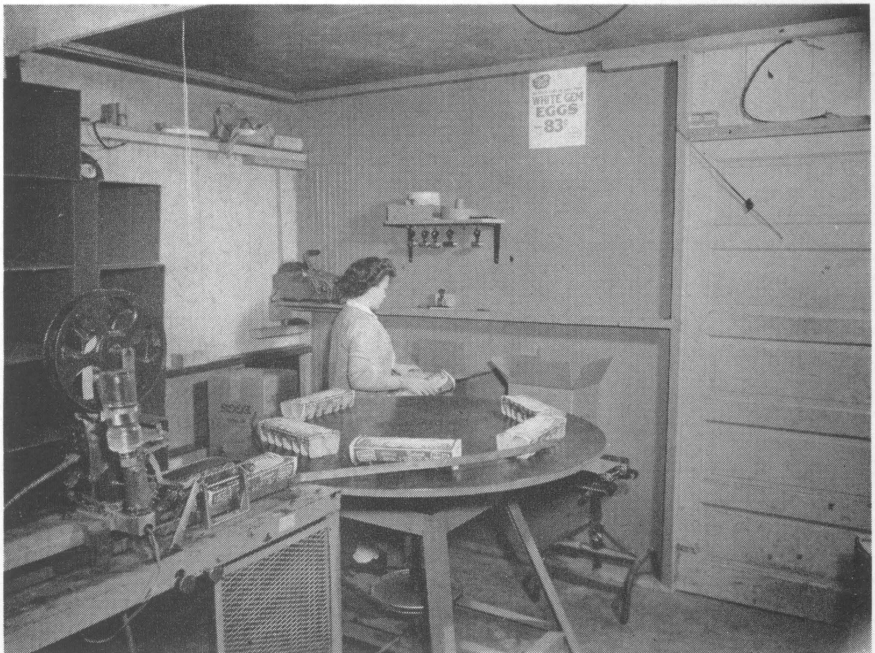


Fig. 6.—The present trend is toward more and more eggs being sold in cartons. Here is the final step in the packaging of eggs for market in those containers.

A large percentage of consumers interviewed bought eggs in paper bags, which are an inadequate method of packaging eggs, and an indication of laxity in egg marketing methods.

The study indicates that in general, the younger housewives had less understanding about egg quality than the older housewives interviewed; hence, consumer education should be directed toward the younger housewives, especially in the lower income group.

Regardless of the quality of eggs purchased, thrifty housewives should protect that quality by placing the eggs in a clean, cold refrigerator as quickly as possible.

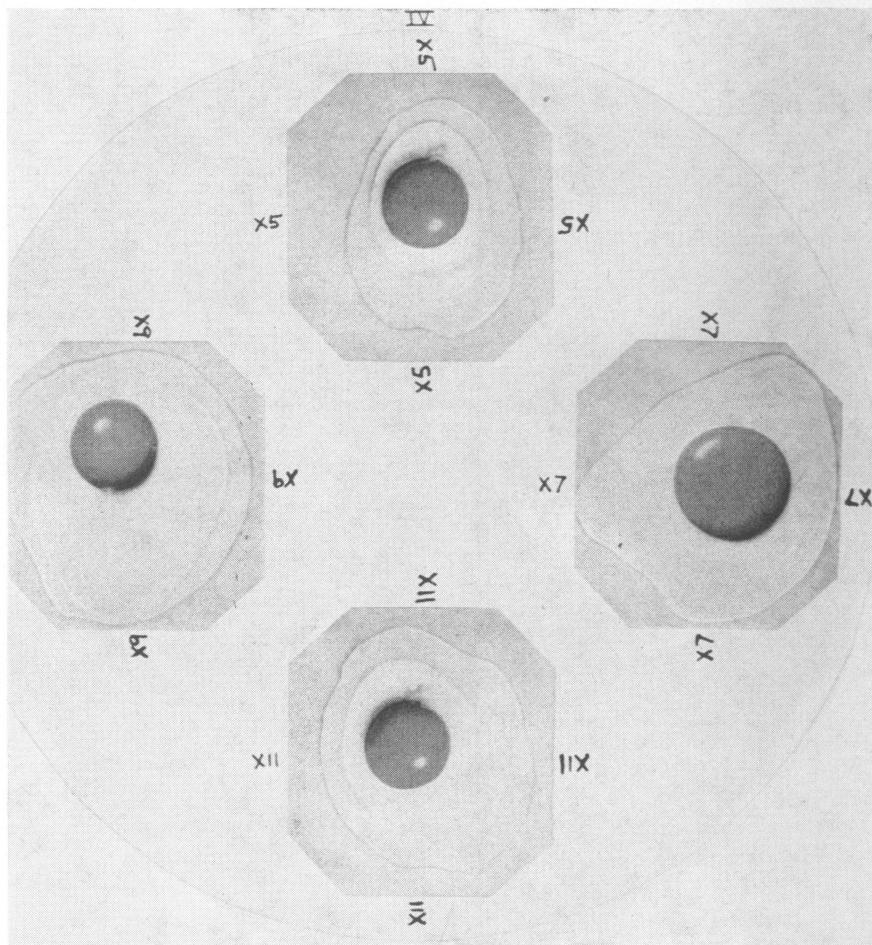


Fig. 7.—This disc in color was used to check the homemaker's preference for eggs. Seventy percent selected the A or AA grade.

The large number of consumers interviewed that indicated a preference for fried chicken is indicative of the potential demand for broiler and frying chickens.

It is encouraging that so few consumers preferred New York dressed poultry, because it is more likely to have a bad flavor than oven ready chicken and thus result in consumer dissatisfaction and a resultant drop in poultry consumption.

There has been a rather constant increase in per capita consumption of turkey in the United States, but present consumption has not even approached attainable goals.

The economic advantages of the "off season" purchase of turkey should be made known to consumers.

The sale of turkey halves and quarters has been developed as a way of increasing the sale of large turkeys. When the price of heavy tom turkeys is lower than the price for hen turkeys, it is more economical for a consumer to buy half a tom turkey. It has been reported that once a consumer purchases some form of cut-up turkey it is not difficult to make repeat sales.

SUMMARY

Based on interviews with a stratified, random sample of 300 housewives in Columbus, Ohio during September and October, 1950, much was learned about the egg and poultry consumption within families, family egg and poultry purchasing habits, consumer knowledge of quality grades and physical characteristics of eggs, and preferences, demands and buying habits of Columbus consumers.

1. Annual per capita egg consumption was estimated at 327 eggs, not including eggs used in prepared food mixes and table-ready food products.
2. Almost 75 percent of the consumers interviewed were willing to pay a premium for good eggs.
3. Almost 70 percent of the consumers interviewed purchased eggs once each week. About 45 percent bought eggs from farmers. Approximately 37 percent of the housewives purchased eggs from retail grocers. More than 97 percent stated that they did not buy any particular brand of eggs.
4. Over 60 percent of the consumers interviewed listed "quality" first when asked to name their most important consideration on buying eggs. Almost 98 percent kept eggs in the refrigerator.

5. More than half, or 53.7 percent of the consumers interviewed purchased eggs packed in cartons. There was no significant difference between carton and bulk egg purchases as related to income groups.

6. Eighty-two and one-tenth percent of the consumers interviewed had no egg buying problems or complaints about recent egg purchases.

7. Almost 90 percent of the consumers interviewed had no method of determining interior quality before purchasing eggs. Most consumers knew something about determining the quality of broken-out eggs.

8. Only about 10 percent of the consumers interviewed noticed seasonal variation in egg quality.

9. Forty-one percent of the consumers interviewed purchased quality graded eggs. Over 50 percent purchased large or extra large eggs. Twenty-nine percent purchased eggs ungraded for size.

10. More consumers interviewed preferred medium yolk color than preferred both light and dark colored yolks but, more housewives were concerned with uniformity than with shade of color. There seemed to be no decided preference for any particular shell color among consumers interviewed in Columbus.

11. Over 82 percent of the consumers interviewed served chicken 1 to 4 times each month. Negroes served chicken most frequently.

12. Almost 82 percent of the consumers interviewed purchased some form of freshly drawn poultry. Parts were purchased by 14 percent. Almost 85 percent of the housewives interviewed reported fried chicken to be a favorite among their family members.

13. Retail grocers constituted the most important source of poultry followed by poultry markets.

14. Only 11 percent of the consumers interviewed had complaints about poultry which they had purchased in recent weeks.

15. Almost 25 percent of the consumers interviewed never served turkey. Consumers in the higher income brackets served turkey more frequently than those in the lower income groups.

16. More than 50 percent of the consumers interviewed stated that they would not buy or serve more turkey regardless of the form in which it was sold.

17. Less than 25 percent of the consumers interviewed served duck during the course of a year, and only 9 percent served goose as often as once during the year.

BIBLIOGRAPHY

- Annual Report of the Poultry and Egg National Board. (Fifth Annual Report), Chicago, 1945.
- ANONYMOUS. "The Challenge of Under-Consumption." Publication of the United States Department of Agriculture Federal Surplus Commodities Corporation, February, 1940.
- BACKUS, KIMBALL L., HARRY LEWIS and H. A. RAY. "A Survey of Consumers Regarding the Purchase and Use of Eggs in Wichita, Kansas." Division of Marketing, Kansas State Board of Agriculture, Mimeographed Bulletin, June, 1949.
- BAKER, RALPH L. and ALAN S. GOLDMAN. "Habits, Preferences and Demands of Des Moines Egg Consumers." Poultry Science, Vol. XXX, No. 3, May, 1951, pp. 329-339.
- BLACKWOOD, FRANCES. "Consumers Have Definite Ideas about Quality in Poultry." "NEPPCO News." Trenton: April 1, 1949, p. 2.
- BRITTON, VIRGINIA. "Food Consumption of 538 Farm and 299 Village Families in Vermont." Vermont Agricultural Experiment Station Bulletin 474, June, 1941.
- BROWN, LYNDON O. Marketing and Distribution Research. Revision of Market Research and Analysis. New York: The Ronald Press Company, 1949.
- BUSTER, MELVIN W. and H. G. F. HAMANN. "Uniform Labels for Consumer Grades of Eggs." United States Department of Agriculture War Food Administration Miscellaneous Publication 560, 1945.
- CARPENTER, ROWENA S. "Poultry Grading and Inspection Program: High Lights for Consumers." United States Department of Agriculture Production and Marketing Administration Leaflet PA—96, March, 1950.
- CARTER, C. W., F. Z. BEANBLOSSOM and R. B. HALPIN. "Consumer Preference of Eggs." Texas Agricultural Experiment Station Progress Report 1022, July 11, 1946.
- Chicago Sun Times Pantry Poll. Special publication of "The Chicago Sun Times," No. 9, April, 1948, p. 32.
- Columbus and Its Trading Areas. Report of the Columbus Chamber of Commerce, Columbus, Ohio, 1950.
- Consumer Analysis of the Greater Columbus Market. Special publication of "The Columbus Dispatch," 4th Annual Report, 1950, p. 44.
- Consumer Guides for Buying and Keeping Eggs. United States Department of Agriculture Production and Marketing Administration Leaflet AIS-77, October, 1948.
- Consumption of Food in the United States 1909-48. United States Department of Agriculture Bureau of Agricultural Economics Miscellaneous Publication 691, August, 1949.
- CORBETT, R. B. "A Study of Consumers' Preferences and Practices in Buying and Using Eggs." Rhode Island Agricultural Experiment Station Bulletin 240, September, 1933.
- Creams versus Whites. "American Egg and Poultry Review." Vol. XI, No. 9, September, 1950, p. 24.
- CRON, L. E., R. F. BURDETTE and S. H. De VAULT. "Economic Analysis of the Baltimore Egg Market." Maryland Agricultural Experiment Station Bulletin 430, October, 1939.
- DANKERS, W. N. "Lack of Uniformity in Egg Grades at the Producer and Consumer Levels." Minnesota Agricultural Extension Service Mimeographed Bulletin, 1946.
- DAWSON, L. E. and G. B. WOOD. "Merchandising Turkey Quarters." Indiana Agricultural Experiment Station Bulletin 537, October, 1949.
- DENHAM, C. B. "Influence of The Consumer." "American Egg & Poultry Review." Vol. X, No. 2, February, 1949, pp. 23-24.
- DOBSON, GORDON J. Preferences and Practices of Upper Arlington Consumers in Buying Eggs and Poultry. Thesis, The Ohio State University, 1949.
- Eggs and Poultry in City Diets. United States Department of Agriculture Bureau of Human Nutrition and Home Economics Commodity Summary No. 4, October, 1949.

- ELLIOTT, F. B. "Consumer Preferences for Eggs." *Poultry Science*, Vol. X, No. 7, October-November, 1941, pp. 400-401.
- ERDMAN, H. E., G. B. ALCORN and A. T. MACE. "Egg Marketing in the Los Angeles Area." *California Agricultural Experiment Station Bulletin* 656, November, 1941.
- FISCHER, C. M. and D. B. De LOACH. "Consumer Response to the Marketing of Cut-Up Turkey." *Oregon Agricultural Experiment Station Bulletin* 457, August, 1948.
- FISCHER, S. H. "Consumption of Eggs in Syracuse." *"Farm Economics,"* No. 157, October, 1947, p. 4070.
- FOWLER, H. C. "The Relation of Quality to the Retail Price of Eggs in Rhode Island." *Rhode Island Agricultural Experiment Station Bulletin* 265, April, 1938.
- GABRIEL, HARRY S. "The Marketing of Chickens, Turkeys, and Eggs in Wilmington." *Delaware Agricultural Experiment Station Bulletin* 218, August, 1939.
- GANS, A. R. "Relation of Quality to the Retail Price of Eggs in New York City." *New York Agricultural Experiment Station Bulletin* 597, April, 1934.
- GARRISON, H. E. "Consumer Attitudes and Habits Regarding Frozen Foods." *"The University of Tennessee Record Extension Series,"* Vol. XXIV. No. 1, February, 1949.
- GRAHAM, W. R. "Is Consumer Education the Extension Man's Job?" *Poultry Science*, Vol. XV, No. 5, September, 1936, p. 411.
- HAUER, LLOYD J. "Get the Customer's Angle and You Sell More." *"The U. S. Egg and Poultry Magazine,"* February, 1951, p. 22.
- HOPPER, W. C. "Consumption of Certain Perishable Farm Products in Albany, New York." *New York Agricultural Experiment Station Bulletin* 586, March, 1934.
- _____. "Income and Food Consumption." *"Canadian Journal of Economics and Political Science,"* Vol. IX, No. 4, April, 1943, pp. 487-606.
- JOHNSON, E. A. "Getting Together With the Consumer." *"Extension Service Review,"* Vol. XX, No. 5, May, 1949, pp. 86-87.
- KNUDSEN, LILA F. and F. L. THOMSEN. "Habits in Consumption of Eggs in New York City," *Seventh World's Poultry Congress and Exposition: Proceedings*, Baltimore: Waverly Press, Inc., 1939, pp. 395-400.
- KOONZ, CARL H. "What's our Consumer Score?" *"U. S. Egg and Poultry Magazine,"* Vol. LV, No. 5, May, 1949, pp. 12-13.
- LARZELERE, H. E. and J. B. LEAVER. "Consumer Response to Chickens in 1948." *"Michigan Agricultural Experiment Station Quarterly Bulletin,"* Vol. XXXI, No. 4, May, 1949, pp. 409-415.
- LARZELERE, H. E. and W. A. NICHOLS. "What Consumers Think About the Eggs They Buy." *"Michigan Agricultural Experiment Station Quarterly Bulletin,"* Vol. XXXII, No. 4, May, 1950, pp. 513-519.
- LAURENT, C. K. "Consumer Purchase of Eggs in Syracuse, New York, June 1941 and 1947." *"Farm Economics,"* No. 174, March, 1950, pp. 4473-4474.
- LINDSEY, A. H. and H. W. YOUNT. "Relation Between Egg Quality and Price." *Massachusetts Agricultural Experiment Bulletin* 282, May, 1932.
- LININGER, F. F. and T. B. CHARLES. "A Study of Egg and Poultry Consumption in Pennsylvania." *Pennsylvania Agricultural Experiment Station Bulletin* 222, March, 1928.
- LISTON, MARGARET I. "A Study of Quality Demands in Household Buying of Food." *Vermont Agricultural Experiment Station Bulletin* 415, April, 1937.
- Marketing Margins and Efficiency. A Report of the Marketing Research Workshop. Lafayette: July 9 to 19, 1950.
- MORTENSON, W. P. and J. B. HAYES. "Highlights of Survey of Consumers' Egg Preferences." Unpublished report prepared at the University of Wisconsin, April 11, 1946.
- NORTH CENTRAL POULTRY MARKETING RESEARCH COMMITTEE. "Changes in Egg Quality During Marketing." *Michigan Agricultural Experiment Station Special Bulletin* 361, August, 1949.

- NYBROTEN, NORMAN. "Rate of Commodity Disappearance and Consumer Preference." *Journal of Farm Economics*, Vol. XXXI, No. 6, May, 1949, pp. 346-350.
- PIERCE, HOWARD C. "The Consumer Has the Final Say." "The U. S. Egg and Poultry Magazine," February, 1951, pp. 48-49.
- PREWITT, CLEMOTH E. A Survey of the Consumption of Poultry and Eggs by the Negro Population of Columbus, Ohio in 1948-1949. Thesis, The Ohio State University, 1949.
- Quality Interests Consumer More Than Shell Color. "U. S. Egg and Poultry Magazine," Vol. LVI, No. 9, September, 1950, p. 17.
- SCUDDER, FRANCES. "The Role of Consumer Education." "Extension Service Review," Vol. XX, No. 1, January, 1949, pp. 10-11.
- SHEPHERD, GEOFFREY S. *Marketing Farm Products*. 2nd Ed., Rev. Ames, Iowa: The Iowa State College Press, 1947.
- SHERMAN, R. W. and JOHN W. SHARP. "Frozen Food Consumption." "Ohio Farm and Home Research," Ohio Agricultural Experiment Station Bi-Monthly Publication, Vol. XXXV, No. 64, May-June, 1950, p. 45.
- SMITH, E. Y. "Giving the Consumer What He Wants for His Turkey Dinner." *Poultry Science*, Vol. XIV, No. 5, September, 1935, p. 312.
- STADELMAN, WILLIAM J. "Consumers Tell What Kind of Eggs They Want." "The U. S. Egg and Poultry Magazine," Vol. LVI, No. 6, June, 1950, pp. 12-13.
- STEVENS, HAROLD F. "A Survey of Poultry and Egg Marketing in Richland County." Ohio Extension Service Mimeographed Bulletin, 1947.
- STIEBELING, H. K. et al. *Family Food Consumption and Dietary Levels: Five Regions*. United States Department of Agriculture Miscellaneous Publication 452, 1941.
- STIEBELING, HAZEL K. and ESTHER F. PHIPARD. "Diets of Families of Employed Wage Earners and Clerical Workers in Cities." United States Department of Agriculture Circular 507, January, 1939.
- Survey of Four Cities. "The Poultry and Egg Situation." United States Department of Agriculture Bureau of Agricultural Economics, April, 1949.
- TERMOHLEN, W. D. and J. W. KINGHORNE. "Consumer Education and What is Being Done About It." *Poultry Science*, Vol. XIX, No. 5, September, 1940, p. 364.
- THOMSEN, F. L. and BERLEY WINTON. "Consumer Preferences for Egg Yolk Color and Shell Color in New York City." Missouri Agricultural Experiment Station Bulletin 329, August, 1933.
- TINLEY, J. M. and E. C. VOORHIES. "Economic Problems Affecting Poultry Marketing in California," California Agricultural Experiment Station Bulletin 642, October, 1940.
- TOBIN, B. F. "Consumer Preferences are Key to Marketing Trends." "The U. S. Egg and Poultry Magazine," Vol. LIV, No. 9, September, 1948, pp. 12-13.
- TUPPER, G. E. and J. R. HARRIS. "Consumer Egg Buying Habits in Peoria, Illinois." Business Study No. 1. Peoria: Bradley University, 1950.
- VOORHIES, EDWIN C. "California Turkeys: Situation and Outlook, 1948." California Agricultural Experiment Station Circular 380, March, 1948.
- WAIT, WARREN C. and C. CARROLL. "Egg Buying by Consumers in Minneapolis." "Farm Business Notes," No. 304, University of Minnesota, May 31, 1946.
- WILSON, LUCILLE P. "Quality Eggs from the Housewife's Standpoint." Indiana Agricultural Extension Service Mimeographed Leaflet P-22, 1949.
- WINTON, BERLEY. "Consumer Preference for Eggs in New York." *Poultry Science*, Vol. XII, No. 5, September, 1933, p. 315.